Project Delivery Network

ITS (ATMS) Design QC Checklist

Version
01/16/2011

QC Manager:
Michael Adams

Introduction

The Project Delivery Network ITS (ATMS) Design QC Checklist is to be used with the UDOT QC/QA Procedure. This checklist is a tool to assist the project team in verifying all work is produced with due diligence, using acceptable industry standard techniques, available resources and data, and reasonable decisions by competent professionals. The checklist is a tool for the delivery of quality documents and cannot replace the sound judgment and experience of competent professionals. It is the Design Team's responsibility to verify the quality of project documents **before** distribution.

Checklist Instructions

For each deliverable listed, the QC Checker is to verify all items listed in the checklist are complete, along with any additional items the QC Checker deems necessary. The checklist items are not to be interpreted as the only items that need to be verified.

Once all items are verified, the QC Checker is to sign the associated cover sheet and upload it onto ProjectWise. The QC is not complete until the cover sheet is signed, dated, and uploaded onto ProjectWise. See the Project Delivery Network QC/QA Procedure for the appropriate cover sheet.

QC reviews are to be completed **before** distribution.

The following explanations are to aid in completing the QC checklist items:

- A checklist item deemed "complete", "correct", or "accurate" does not denote that the item is perfect, but rather that the item satisfies design criteria based on known information, acceptable techniques, and sound judgment."
- A checklist item deemed "addressed" denotes the item as "reviewed all known concerns and verified the concerns are appropriately mitigated and satisfy design criteria." Addressed concerns are not necessarily incorporated into the design, but satisfactorily mitigated.
- A checklist item deemed "identified" denotes the item as "an acceptable and economical approach to satisfy design criteria based on known information."
- A checklist item deemed "verified" denotes the item as "verified the approach/conclusion as acceptable based on known information."
- Use the check boxes to verify checklist items are complete. If a checklist item is *not applicable* to the current project, place an NA over the check box to denote the item as not applicable. This will allow the quality assurance to verify all items were addressed.
- Use the comment sections of the Cover Sheets to address exceptions, assumptions, and unique aspects of the project. The comments will help others understand why certain decisions were made and their impacts on the project.

ITS (ATMS) Instructions

TMD = Traffic Management Division

1C1 Assess ITS (ATMS) Needs

Review the existing conditions, ITS Strategic Plan, and project objectives to develop recommendations to meet ITS needs.

References

1. Project ITS Scoping Summary Form
2. UDOT Project Delivery Network
3. UDOT QC/QA Procedures
4. UDOT Practical Design Guide

Project ITS Scoping Summary

1. ☐ The ITS Program Manager was contacted to discuss the needs of all TMD groups.
2. ☐ Each ITS device type was discussed with the appropriate TMD groups.
    a. ☐ Project Development
        i. ☐ Project Managers
        ii. ☐ Fiber Optics & Communications
        iii. ☐ Planning
    b. ☐ Traffic Operations
        i. ☐ Control Room Operations
        ii. ☐ Traffic Mobility Engineer
        iii. ☐ Signal Engineering
    c. ☐ Weather Operations Manager
    d. ☐ Maintenance – Electronics Manager
3. ☐ ITS Project Needs Summary is completed.
4. ☐ All recommendations are prioritized appropriately.
5. ☐ The cost estimate addresses all recommended ITS improvements with appropriate risk considerations and contingencies.

3C1 Develop ITS (ATMS) Components Design

Identify the ITS device locations and prepare a preliminary ITS cost estimate.

References

1. UDOT Standard and Supplemental Drawings
2. UDOT Plan Sheet Development Standards
3. UDOT CADD Standards
4. UDOT Project Delivery Network
5. UDOT QC/QA Procedures
6. UDOT Practical Design Guide

Preliminary ITS (AT) Plan Sheets

1. ☐ **CCTV** locations meet TMD requirements.
    a. ☐ CCTV placement meets the TMD standards.
        i. ☐ The height and line of sight for each pole is correct.
        ii. ☐ For CCTV located on a curve, they are located on the outside of the curve.
        iii. ☐ Each CCTV is placed to achieve maximum viewing coverage.
        iv. ☐ All poles are properly identified as lowering or static.
        v. ☐ If VMS is part of the project, a CCTV is placed to read the message of each VMS sign.
    b. ☐ Utility conflicts are identified.
        i. ☐ Each device is located to minimize utility impacts due to location of pole, foundation, and conduit.
        ii. ☐ All conflicts are identified and coordinated with the utility team.
        iii. ☐ All existing ITS utilities are identified as "Keep In Service" or negotiated with the TMD for disconnection if they cannot be reasonably protected. The TMD must approve all disconnections of existing ITS facilities.
    c. ☐ The power source is identified.
        i. ☐ The location of the power source connection for each device is identified.
        ii. ☐ The power company has approved the connection locations.
    d. ☐ The communications source is identified.
        i. ☐ Each device is identified as wireless or hard wire.
        ii. ☐ The location of the communications connection for each hard wire device is identified.
        iii. ☐ The communications company has approved the connection locations.
        iv. ☐ The TMD Fiber Manager has approved the connection locations.

3C1 Continued

e. ☐ All facilities are located within the proposed ROW.

i. ☐ Any additional ROW needs were coordinated with ROW team.

ii. ☐ All necessary easements, including aerial easements for power and communications connections and temporary construction easements are identified and coordinated with the ROW team.

iii. ☐ All facilities are located outside the clear zone or adequate protective measures are proposed.

iv. ☐ An access point for maintenance for each device structure is identified and will accommodate appropriate maintenance equipment, without impacting traffic and without requiring maintenance personnel to climb or mount obstructions.

v. ☐ All environmental conflicts are identified.

2. ☐ **Traffic Monitoring Stations (TMS)** locations meet TMD requirements.

a. ☐ All TMS locations have been coordinated with the Traffic Mobility Engineer.

b. ☐ All TMS device types have been coordinated with the Traffic Mobility Engineer.

c. ☐ Coordinated with Systems Planning and Programming to determine the possibility to consolidate/supplement the ATR system with the TMS system.

d. ☐ Utility conflicts are identified.

i. ☐ Each device is located to minimize utility impacts due to location of pole, foundation, and conduit.

ii. ☐ All conflicts are identified and coordinated with the utility team.

iii. ☐ All existing ITS utilities are identified as "Keep In Service" or negotiated with the TMD for disconnection if they cannot be reasonably protected. The TMD must approve all disconnections of existing ITS facilities.

e. ☐ The power source is identified.

i. ☐ The location of the power source connection for each device is identified.

ii. ☐ The power company has approved the connection locations.

f. ☐ The communications source is identified.

i. ☐ Each device is identified as wireless or hard wire.

ii. ☐ The location of the communications connection for each hard wire device is identified.

iii. ☐ The communications company has approved the connection locations.

iv. ☐ The TMD Fiber Manager has approved the connection locations.

3C1 Continued

g. ☐ All facilities are located within the proposed ROW.

i. ☐ Any additional ROW needs have been coordinated with ROW team.

ii. ☐ All necessary easements, including aerial easements for power and communications connections and temporary construction easements are identified and coordinated with the ROW team.

iii. ☐ All facilities are located outside the clear zone or adequate protective measures are proposed.

iv. ☐ An access point for maintenance for each device structure is identified and will accommodate appropriate maintenance equipment, without impacting traffic and without requiring maintenance personnel to climb or mount obstructions.

v. ☐ All environmental conflicts are identified.

3. ☐ **Variable Message Sign (VMS)** locations meet TMD requirements.

a. ☐ All VMS are located at an adequate distance from decision points.

b. ☐ All VMS meet minimum sight distance requirements.

c. ☐ The type of VMS at each location is identified.

i. ☐ The number of pixels, character height, and number of lines are identified for each sign.

ii. ☐ LED viewing cone (15, 30 degree etc.) is identified for each sign.

iii. ☐ The structure type is identified for each sign.

iv. ☐ Each ATMS cabinet is placed to view the display message.

v. ☐ Each sign message is visible by an existing or proposed CCTV.

d. ☐ Utility conflicts are identified.

i. ☐ Each device is located to minimize utility impacts due to location of pole, foundation, and conduit.

ii. ☐ All conflicts are identified and coordinated with the utility team.

iii. ☐ All existing ITS utilities are identified as "Keep In Service" or negotiated with the TMD for disconnection if they cannot be reasonably protected. The TMD must approve all disconnections of existing ITS facilities.

e. ☐ The power source is identified.

i. ☐ The location of the power source connection for each device is identified.

ii. ☐ The power company has approved the connection locations.

f. ☐ The communications source is identified.

3C1 Continued

i. ☐ Each device is identified as wireless or hard wire.

ii. ☐ The location of the communications connection for each hard wire device is identified.

iii. ☐ The communications company has approved the connection locations.

iv. ☐ The TMD Fiber Manager has approved the connection locations.

g. ☐ All facilities are located within the proposed ROW.

i. ☐ Any additional ROW needs were coordinated with ROW team.

ii. ☐ All necessary easements, including aerial easements for power and communications connections and temporary construction easements are identified and coordinated with the ROW team.

iii. ☐ All facilities are located outside the clear zone or adequate protective measures are proposed.

iv. ☐ An access point for maintenance for each device structure is identified and will accommodate appropriate maintenance equipment, without impacting traffic and without requiring maintenance personnel to climb or mount obstructions.

v. ☐ All environmental conflicts are identified.

4. ☐ **RWIS** locations meet TMD requirements.

a. ☐ The Weather Operations Manager has approved the site selections.

b. ☐ The Weather Operations Manager has approved the instrument selections.

c. ☐ Utility conflicts are identified.

i. ☐ Each device is located to minimize utility impacts due to location of pole, foundation, and conduit.

ii. ☐ All conflicts are identified and coordinated with the utility team.

iii. ☐ All existing ITS utilities are identified as "Keep In Service" or negotiated with the TMD for disconnection if they cannot be reasonably protected. The TMD must approve all disconnections of existing ITS facilities.

d. ☐ The power source is identified.

i. ☐ Innovative methods for power needs were addressed (i.e. solar).

ii. ☐ If power source connection is needed, the location for each device is identified.

iii. ☐ The power company has approved all connection locations.

e. ☐ The communications source is identified.

i. ☐ Each device is identified as wireless, hard wire, radio links, or other communication method.

ii. ☐ The location of the communications connection for each hard wire device is identified.

iii. ☐ The communications company has approved the connection locations.

iv. ☐ The TMD Fiber Manager has approved the connection locations.

f. ☐ All facilities are located within the proposed ROW.

i. ☐ Any additional ROW needs have been coordinated with ROW team.

ii. ☐ All necessary easements, including aerial easements for power and communications connections and temporary construction easements, are identified and coordinated with the ROW team.

iii. ☐ All facilities are located outside the clear zone or adequate protective measures are proposed.

iv. ☐ An access point for maintenance for each device structure is identified and will accommodate appropriate maintenance equipment, without impacting traffic and without requiring maintenance personnel to climb or mount obstructions.

v. ☐ All environmental conflicts are identified.

5. ☐ **Signal Interconnect** locations meet TMD requirements.

a. ☐ Each location is properly identified as wireless or fiber optic.

b. ☐ Each mid block detection meets TMD requirements.

c. ☐ Each additional CCTV meets TMD requirements.

d. ☐ Utility conflicts are identified.

i. ☐ Each device is located to minimize utility impacts due to location of pole, foundation, and conduit.

ii. ☐ All conflicts are identified and coordinated with the Utility team.

iii. ☐ All existing ITS utilities are identified as "Keep In Service" or negotiated with the TMD for disconnection if they cannot be reasonably protected. The TMD must approve all disconnections of existing ITS facilities.

e. ☐ The power source is identified.

i. ☐ The location of the power source connection for each device is identified.

ii. ☐ The power company has approved the connection locations.

f. ☐ The communications source is identified.

3C1 Continued

i. ☐ Each device is identified as wireless or hard wire.

ii. ☐ The location of the communications connection for each hard wire device is identified.

iii. ☐ The communications company has approved the connection locations.

iv. ☐ The TMD Fiber Manager has approved the connection locations.

g. ☐ All facilities are located within the proposed ROW.

i. ☐ Any additional ROW needs are coordinated with ROW team.

ii. ☐ All necessary easements, including aerial easements for power and communications connections and temporary construction easements, are identified and coordinated with the ROW team.

iii. ☐ All facilities are located outside the clear zone or adequate protective measures are proposed.

iv. ☐ An access point for maintenance for each device structure is identified and will accommodate appropriate maintenance equipment, without impacting traffic and without requiring maintenance personnel to climb or mount obstructions.

v. ☐ All environmental conflicts are identified.

6. ☐ **Ramp Meters** locations meet TMD requirements.

a. ☐ The vehicle storage length and number of lanes were evaluated for each location.

b. ☐ The acceleration lanes were evaluated for each location.

c. ☐ Utility conflicts are identified.

i. ☐ Each device is located to minimize utility impacts due to location of pole, foundation, and conduit.

ii. ☐ All conflicts are identified and coordinated with the Utility team.

iii. ☐ All existing ITS utilities are identified as "Keep In Service" or negotiated with the TMD for disconnection if they cannot be reasonably protected. The TMD must approve all disconnections of existing ITS facilities.

d. ☐ The power source is identified.

i. ☐ The location of the power source connection for each device is identified.

ii. ☐ The power company has approved the connection locations.

e. ☐ The communications source is identified.

i. ☐ Each device is identified as wireless or hard wire.

ii. ☐ The location of the communications connection for each hard wire device is identified.

iii. ☐ The communications company has approved the connection locations.

iv. ☐ The TMD Fiber Manager has approved the connection locations.

f. ☐ All facilities are located within the proposed ROW.

i. ☐ Any additional ROW needs were coordinated with ROW team.

ii. ☐ All necessary easements, including aerial easements for power and communications connections and temporary construction easements are identified and coordinated with the ROW team.

iii. ☐ All facilities are located outside the clear zone or adequate protective measures are proposed.

iv. ☐ An access point for maintenance for each device structure is identified and will accommodate appropriate maintenance equipment, without impacting traffic and without requiring maintenance personnel to climb or mount obstructions.

v. ☐ All environmental conflicts are identified.

7. ☐ **HAR** locations meet TMD requirements.

a. ☐ Overhead power interference was evaluated.

b. ☐ Structural interference was evaluated.

c. ☐ How the new facility fits into the existing system was coordinated with the TMD Traffic Operations Engineer.

d. ☐ The vendor device specifications (i.e. range, mounting requirements, etc.) were obtained.

e. ☐ Utility conflicts are identified.

i. ☐ Each device is located to minimize utility impacts due to location of pole, foundation, and conduit.

ii. ☐ All conflicts are identified and coordinated with the Utility team.

iii. ☐ All existing ITS utilities are identified as "Keep In Service" or negotiated with the TMD for disconnection if they cannot be reasonably protected. The TMD must approve all disconnections of existing ITS facilities.

f. ☐ The power source is identified.

i. ☐ The location of the power source connection for each device is identified.

ii. ☐ The power company has approved the connection locations.

g. ☐ The communications source is identified.

3C1 Continued

i. ☐ Each device is identified as wireless or hard wire.

ii. ☐ The location of the communications connection for each hard wire device is identified.

iii. ☐ The communications company has approved the connection locations.

iv. ☐ The TMD Fiber Manager has approved the connection locations.

h. ☐ All facilities are located within the proposed ROW.

i. ☐ Any additional ROW needs were coordination with ROW team.

ii. ☐ All necessary easements, including aerial easements for power and communications connections and temporary construction easements, have been identified and coordinated with the ROW team.

iii. ☐ All facilities are located outside the clear zone or adequate protective measures are proposed.

iv. ☐ An access point for maintenance for each device structure is identified and will accommodate appropriate maintenance equipment, without impacting traffic and without requiring maintenance personnel to climb or mount obstructions.

v. ☐ All environmental conflicts are identified.

8. ☐ **Fiber Optics** locations meet TMD requirements.

a. ☐ All connection locations are identified.

b. ☐ Number of ducts was coordinated with the TMD Fiber Business Manager.

c. ☐ The strand count was coordinated with the TMD Fiber Business Manager.

d. ☐ Utility conflicts are identified.

i. ☐ Each device is located to minimize utility impacts due to location of pole, foundation, and conduit.

ii. ☐ All conflicts are identified and coordinated with the Utility team.

iii. ☐ All existing ITS utilities are identified as "Keep In Service" or negotiated with the TMD for disconnection if they cannot be reasonably protected. The TMD must approve all disconnections of existing ITS facilities.

e. ☐ All facilities are located within the proposed ROW.

i. ☐ Any additional ROW needs were coordinated with ROW team.

ii. ☐ All necessary easements, including aerial easements for power and communications connections and temporary construction easements, have been identified and coordinated with the ROW team.

3C1 Continued

iii. ☐ An access point for maintenance for each device structure is identified and will accommodate appropriate maintenance equipment, without impacting traffic and without requiring maintenance personnel to climb or mount obstructions.

iv. ☐ All environmental conflicts are identified.

9. ☐ All preliminary plan sheets conform to UDOT Plan Sheet Development Standards. (2)

a. ☐ All sheets are cut appropriately.

b. ☐ All reference files are properly attached.

c. ☐ Plan sheet CADD standards are followed and maintained on each sheet.

d. ☐ All labels, callouts, and information necessary for a plan-in-hand review of the ITS (ATMS) design are included and correct.

ITS Cost Estimate

1. ☐ The ITS cost estimate was verified using the Estimate Review Checklist (found at the end of this document).

4C1 Complete ITS (ATMS) Plans and Documents

Complete the ITS plans and project documents and finalize the ITS (ATMS) cost estimates.

References

1. UDOT Standard and Supplemental Drawings
2. UDOT Standard and Supplemental Specifications
3. UDOT Design of Signalized Intersections: Guideline and Checklist
4. UDOT CADD Standards
5. UDOT Plan Sheet Development Standards
6. Specification Writer's Guide
7. Measurement and Payment Template
8. Acceptance and Documentation Guide
9. UDOT Project Delivery Network
10. UDOT QC/QA Procedures
11. UDOT Practical Design Guide
12. Estimate Review Checklist

ITS (AT) Plan Sheets

1. ☐ All review comments are addressed and the comment resolutions sent to all reviewers.
2. ☐ The design conforms to UDOT CADD Standards. (4)
3. ☐ The design conforms to UDOT Standard and Supplemental Drawings and necessary approval for non-standard design elements was obtained. (1)
4. ☐ The State Furnished Equipment List was filled out correctly and submitted to the TMD Region Project Manager.
5. ☐ All ITS devices are shown in the correct locations.
6. ☐ All devices are connected with conduit.
7. ☐ The electrical layout from the power supply to the power disconnect is complete and shown correctly.
8. ☐ All facilities are located outside the clear zone or adequately protected.
9. ☐ All devices have an adequate power and communications source identified.
10. ☐ The power company approves of all connection locations.
11. ☐ The communications company approves of all connection locations.
12. ☐ ATMS devices and structures (CCTV) design meets the operations criteria and TMD standards.
    a. ☐ All pole heights are correct.
    b. ☐ All cabinet types are correct (standard or pole mounted).
    c. ☐ All maintenance access points are approved by the TMD Maintenance Manager.

4C1 Continued

d. ☐ ATMS devices and structures (CCTV) are located out of the clear zone or adequately protected.

e. ☐ All cabinets are outside the snowplow discharge zone or adequately protected.

13. ☐ Traffic Management Station (TMS) design meets the operations criteria and TMD standards.

a. ☐ Pavement Imbedded Wireless Detector selection is appropriate and meets criteria.

i. ☐ The selected wireless devices are designed appropriately to stay within manufacturer's performance limits.

ii. ☐ The line of sight is adequate for the selected device (structures, landscaping, etc.).

iii. ☐ The selected equipment and system are compatible with the existing system.

iv. ☐ The placement of all devices conforms to UDOT standards. (3)

b. ☐ Radar selection is appropriate and meets criteria.

i. ☐ Each device is placed to accurately read all lanes.

ii. ☐ The design layout of detection zones and wireless device placement follows manufacturer recommendations and does not exceed performance limits.

c. ☐ Loops selection is appropriate and meets criteria.

i. ☐ The placement of all loops and loop groups conforms to UDOT standards. (3)

ii. ☐ The selected loops are designed appropriately to stay within manufacturer's performance limits.

14. ☐ Variable Message Signs (VMS) design meets the operations criteria and TMD standards.

a. ☐ Horizontal placement over the correct lanes.

b. ☐ Structures reviewed and approved the VMS structure and foundation.

c. ☐ Vehicle clearance requirements are met.

d. ☐ LED viewing cone and sign alignment meet driver visibility requirements.

e. ☐ The type of VMS selected meets the operations criteria.

f. ☐ Static signs do not block the CCTV view of the VMS.

g. ☐ Static signs and VMS have been coordinated to meet visibility requirements and avoid conflicts.

h. ☐ The selected loops are designed appropriately to stay within manufacturer's performance limits.

15. ☐ RWIS design meets the operations criteria and TMD standards.

a. ☐ The selected loops are designed appropriately to stay within manufacturer's performance limits.

4C1 Continued

16. ☐ Signal Interconnect design meets the operations criteria and TMD standards.
    a. ☐ Box types (I, II, and III) are correctly identified per standards.
    b. ☐ Each cabinet is the correct size and in the correct location.
17. ☐ Ramp Meters design meets the operations criteria and TMD standards.
    a. ☐ The selected components are designed appropriately to stay within manufacturer's performance limits.
    b. ☐ The ramp meters are designed to meet the operations criteria.
18. ☐ Fiber Optics design meets the operations criteria and TMD standards.
    a. ☐ Boxes types (I, II, and III) are correctly identified per standards.
    b. ☐ A general note to contact the Fiber Business Manager (with correct name and phone number) to obtain splicing details 30 days prior to beginning splice work.
    c. ☐ All splice locations have been approved by the Fiber Business Manager.
    d. ☐ Location markers quantity and locations are correct.
    e. ☐ All new fiber conduit is identified.
    f. ☐ Fiber cable strand count is identified.
19. ☐ ITS (AT) plan sheets conform to *UDOT Plan Sheet Development Standards*.
    a. ☐ *PSDS General Plan Sheet Requirements* are followed. (5)
    b. ☐ Call-out rules are followed.
    c. ☐ All title blocks are filled out correctly.
    d. ☐ CADD standards are maintained on each sheet.
    e. ☐ All necessary notes, callouts, legends, etc. are included, correct, and neatly organized.
    f. ☐ All pay item callouts match the Engineer's Estimate pay items.
    g. ☐ All conduit line work is shown accurately to depict all connections.
    h. ☐ All cut/fill lines for mainline, ramps, and side streets are shown.
    i. ☐ All callouts/labels are correct.
    j. ☐ Wire schedule is included and correct.
    k. ☐ All existing TMD facilities (devices, conduit, etc.) within or in close proximity to the project are identified as either replace, relocate, or protect.
20. ☐ **Legend sheet** conforms to the UDOT Standard Drawing AT 1. (1)
    a. ☐ All applicable general notes are included and correct.
    b. ☐ All construction notes are applicable and correct.

4C1 Continued

c. ☐ A note to contact the ITS Region Project Manager for state furnished materials is included and contains the correct name and contact information.

21. ☐ **Detail sheets** are complete. (See (5) – Detail Sheet Requirements)
    a. ☐ All necessary details to build the project are included.
    b. ☐ The *PSDS DT Sheet Checklist* items are complete.
    c. ☐ All details are labeled and dimensioned completely and correctly. (5)
    d. ☐ All necessary labels, callouts, identifiers, symbols, and notes are provided and correct.
22. ☐ **Summary Sheets** are complete. (See (5) – Summary Sheet Requirements)
    a. ☐ The *PSDS Summary Sheet Requirements* are followed and complete.
    b. ☐ UDOT standard summary sheets are used.
    c. ☐ All pay items are included in the summary.
    d. ☐ All pay item names, alignment designations, stations, offsets, units, and quantities are correct.
    e. ☐ All summaries are exported from Excel to Microstation and the sheets are updated with the current Excel version.
    f. ☐ All summary items and quantities are exported into PDBS.

ITS Project Documents

1. ☐ The **Special Provisions** are complete. (6)
    a. ☐ All special provisions conform to the Specification Writers' Guide (verify using Chapter 11 Checklist). (6)
    b. ☐ A special provision has been created for each non-standard item.
    c. ☐ All general and project specific special provision content is accurate, complete, and does not contain anything unnecessary.
2. ☐ The **Measurement & Payment** is complete. (7)
    a. ☐ All M&P items match pay items exactly.
    b. ☐ PDBS was used to generate M&P for all pay items.
    c. ☐ For all non-standard pay items, a complete and correct M&P description of all effort and materials is included.
    d. ☐ All units are correct.
3. ☐ The **Acceptance & Documentation** is complete. (8)
    a. ☐ All A&D items match pay items exactly.

4C1 Continued

b. ☐ PDBS was used to generate A&D for all pay items.

c. ☐ For all non-standard pay items, a complete and correct A&D is included.

ITS Cost Estimate

1. ☐ The Roadway cost estimate was verified using the Estimate Review Checklist (found at the end of this document).

Estimate Review Checklist

Provide review checklist of all design cost estimates.

References

1. Estimating – Roadway Design Manual of Instruction (Section 7.19)
2. Estimator's Corner Website
3. UDOT Project Delivery Network
4. Project Development Business System

Estimate (applies to every stage for updating the estimate)

1. ☐ All necessary bid items are included.
2. ☐ All quantities and units are correct.
3. ☐ All standard bid items match UDOT standard bid items exactly.
4. ☐ Unit prices were estimated using UDOT approved methods (PDBS, local contractors, etc.).
5. ☐ All unit price estimates are documented.
6. ☐ Unit prices reflect the following: (1)
   - a. ☐ Location
   - b. ☐ Time of year for advertising
   - c. ☐ Complexity of constructability
   - d. ☐ Quantity of item
   - e. ☐ Limitations of operation
   - f. ☐ Current bidding environment
   - g. ☐ Availability of materials
   - h. ☐ Familiarity of a process
   - i. ☐ Specialty equipment
   - j. ☐ Risk to contractor
   - k. ☐ Inflation
   - l. ☐ Construction schedule
7. ☐ Lump sum bid prices are used only when appropriate (i.e. unit pricing is too difficult)
8. ☐ All lump sum bid prices considered the following:
   - a. ☐ Contractor risk due to unknown quantity.
   - b. ☐ Difficulty in making it a unit price pay item.

Additional PS&E Estimate

9. ☐ All bid items, quantities, and units match the plan sheet callouts, summary sheets, and M&P exactly.